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BOYS' AND GIRLS' CLUB CONTEST NO. 3

CLASS C—FOR BOYS AND GIRLS

BEAN GROWING CONTEST

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California is famous for the production of dried beans, the farm value of the crop in an average season amounting to nearly $10,000,000. The very favorable climatic conditions enjoyed by a narrow strip of the southern California coast, ranging from San Luis Obispo to San Diego County, gives this State the reputation of being the greatest Lima bean growing country in the world. In the interior of these coast counties as well as up and down the great Sacramento and San Joaquin valleys, Limas cannot be grown commercially, but other varieties of beans thrive and are produced on an extensive scale, over one million sacks being harvested in some years.

It behooves every loyal Californian, therefore, to have an intelligent understanding and appreciation of the importance of this great food producing plant. It is befitting, also, that every boy and girl studying agriculture should take an active interest in bean production and improvement. It is the purpose of this circular to suggest a method for the systematic study of bean culture and to give a few brief directions for growing the crop.

Why Contests Will Help. Most boys and girls, like grown-ups, can do better work when they are matching their knowledge or skill against that of others. To enter a contest at once places a contestant on his mettle and, as in athletic events, he strives his utmost to win just for the fun of winning. The fact that prizes are offered will be only an additional incentive, tending to make the contest more interesting and profitable.

Because of the natural love of competition that exists among boys and girls, those who attend school in bean growing districts are encouraged to engage in a friendly contest to see who can grow the most productive bean vine. This competitive work is of such a nature that those living in the city are on an equal footing with those attending a country school.

The students taking part in these bean growing contests will have the opportunity to win prizes for themselves and bring honor to their schools and communities. What is more important, through their study and practice of the best cultural and plant improvement methods necessary to grow prize-winning beans, they will gain valuable information concerning the science of soils and plant growth that can be applied to other crops as well.

Organization Needed. Coöperation among men and women in every pursuit and occupation of life is the most encouraging movement of recent times and it is destined to be the most important factor in the development of a better and more efficient social and industrial life. Organized effort focuses the attention upon the task at hand, stimulates a desire for knowledge and inculcates the study habit. Club work among boys and girls is proving just as effective as the organized efforts of adults in promoting a wider and better knowledge of the art and science of agriculture.

The school affords an ideal place for all club and contest work to center and it is recommended that whenever five or more students in a school desire to enter a bean growing contest they organize a club with that end in view. It will not be necessary, however, for anyone to join a club in order to qualify in a contest. The formation of clubs is advised because numbers lend enthusiasm and coöperation engenders success.

Nature of the Contest. The Bean Growing Contest will be in two divisions in order to give every boy and girl a better chance to win a prize. In the first division, the contest will be between the members of each school or community club and the prize winners in each local contest will again compete with the winners in the other club contests throughout the city or county. The general or county competitive exhibition, forming the second division of the contest, should be held in connection with the county or district agricultural fair whenever possible or a special school fair or exhibition may be organized for this purpose.

The character and value of the awards to be given in each instance will be determined by the advisory committee in charge of the district or local clubs and by the city or county superintendents of schools, or a committee designated by them, in case of the general contest.

Contest Prizes. Several awards, in cash or its equivalent, ranging in value from first to fifth prize, will be given in each contest to the boys or girls who have grown, selected and exhibited the heaviest yielding bean vine. The prizes will be procured and awarded by the committee in charge of the respective contests. When two or more varieties are entered in a county contest there should be as many classes as varieties and approximate prizes should be offered in each.

Every contestant, whether winning a prize or not, who faithfully complies with all of the contest regulations, will receive, as special recognition of his or her praiseworthy work, a *Certificate of Merit,* signed by the Dean, College of Agriculture, University of California.

In the city or county contest, a special prize in the form of a cup, medal or banner, will be awarded that school, district, or community whose representatives make the most favorable showing.

Contest Regulations. 1. Boys or girls, eighteen years of age or younger, who meet all the requirements of the contest, may qualify and become eligible for the awards.

2. Each contestant shall actually grow at least twenty-five hills of Lima beans (the pole type), or one hundred hills of the white, pink, black-eye, or other bush varieties. Every variety grown should be handled under field culture conditions so far as possible. (For instance, the running type of Lima will not be poled.)

3. Besides performing all the cultural operations incident to bean growing (save those tasks beyond the strength of boys and girls) contestants shall select and exhibit the one bean vine out of all those grown on their respective plots, which in their judgment, has produced the largest number of perfect beans.

4. A crop record or note book, describing all of the work done, from the preparation of the seed-bed to the harvesting of the crop, shall be prepared by each contestant, countersigned by the parent or teacher and filed as part of the exhibit.

5. Each contestant shall be allowed but one exhibit or entry in a contest.

6. In each school or district contest, only that variety of bean shall be grown that experience has shown to be the best adapted to the soil and climatic conditions of that section.

7. In a county or general contest when two or more varieties are entered, all of the exhibits of a given variety shall be judged in a class by themselves.

8. All contest exhibits shall be judged by means of a score card (see suggestive score card on page 6, this circular). The same score card may be used for judging both the local and general exhibits, excepting that in the last named, only the shelled beans shall be exhibited. The record books of prize winning contestants in local contests should be supplemented with a memorandum by the judge of the local contests, stating the actual number of pods and beans found on the prize winning vines.

9. Before contestants shall receive the Certificate of Merit, they must mail their record sheets or note books, containing all the information specified in the Crop Record Plan on page 6, to the Dean, College of Agriculture, University of California, Berkeley.

10. The advisory committee in charge of each local club contest shall make all arrangements for the exhibition that will mark the close of the contest, and for procuring and awarding of prizes. After the exhibits have been scored, the beans on the prize winning vines, which are to be picked off and shelled by the judge or some other disinterested party, are to be placed in a suitable container, together with the contestant's record sheet, and, after being securely sealed, mailed to the city or county superintendent of schools in charge of the general contest.

11. All exhibits are to be the property of the contestants at the close of the exhibition unless the advisory committee rules otherwise. It is suggested that all of the beans produced by the vines placed upon exhibition be saved by the contestants in order to plant a special bean improvement plot another year.

12. These regulations, insofar as they apply to any local or general contest, may be modified or changed at the discretion of the committee in charge.

GENERAL DIRECTIONS FOR GROWING BEANS

On account of the diversity of conditions under which beans are grown in California, it is impossible to give complete directions within the limts of this circular, for growing the crop in the various localities. Contestants are advised to consult Wickson's "California Vegetables" and Sevey's "Bean Culture," which give more complete directions for growing beans. One of these books can be found in nearly every school or public library. Bulletin No. 224, California Experiment Station on Lima Bean Growing and Improvement, which can be obtained free by addressing the Director, Agricultural Experiment Station, University of California, Berkeley, gives complete directions for growing this variety. It is suggested that these books and the bulletin be studied and discussed in connection with this circular at the club meetings.

Influence of Climate. Severity of climate, more than any other factor of environment, limits the production of beans. This is especially true of the Lima and the area in which this variety can be grown commercially is confined to the coast sections of three or four counties in southern California. Here the ocean breezes, fogs and mists provide the favorable atmospheric conditions necessary for Lima bean growth, conditions denied the inland portions of these same counties and the great interior valleys by the mountains which shut out

the moisture-laden ocean winds and prevent the tempering of the hot dry weather so fatal to Lima bean development. On the moist or irrigated lands of the Sacramento and San Joaquin valleys, however, as well as in other sections of the State, the heat and atmospheric aridity are tempered by the evaporating soil moisture to the extent that other varieties of beans can be grown.

Everything considered, the following rather exacting conditions have to be met in successful, commercial bean culture.* During the growing period of the plant, there must be no frost; the least possible duration of hot dry winds; plenty of moisture in the air (relative high humidity); plenty of soil (capillary) moisture to maintain a vigorous, vegetative development, and finally, a dry soil and no rains during the ripening period.

Selection of the Soil. Beans can be grown on soils ranging from sandy to adobe, but the lighter and warmer soils are most desirable, especially when the growing season is short, as it takes the vines longer to mature on the heavier or wet soils. Almost any good garden soil will do for growing beans in this contest, providing good cultivation is given and the ground is kept from baking and drying out.

Varieties to Plant. In the Lima growing sections, only that type of running bean should be planted which experience has shown to be most desirable. In the other bean growing sections, only that variety should be grown which has been found to be most profitable in field culture. The large White or Lady Washington bean is grown chiefly in the Sacramento and San Joaquin valleys, although it does well in the interior of some of the coast counties. The Pink and Black-eye varieties are the best to grow where conditions of heat and drouth prevail. The small White or Navy bean, which is used in making the "canned beans" of commerce, is grown chiefly in the central coast counties. The Bayo, a brown bean, is grown mainly in the Sacramento and San Joaquin valleys.

Preparation of the Soil. Thoroughness of seed-bed preparation is the most important factor in the culture of beans and much more cultivation should be given the soil before planting, than after. Plow or spade the soil in the fall or early winter so that the surface layer will be in a position to absorb and hold all of the winter rains that fall. The surface should be stirred between rains so as to conserve the moisture that has fallen. After most of the rains are over, the ground should again be thoroughly plowed, spaded, or cultivated with a chisel-toothed cultivator. After this until planting time, the field or plot should be cultivated four or five times in order to maintain a surface mulch, which will check evaporation, keep down the weeds, compact the lower soil layers and leave a loose mellow seed-bed.

When to Plant. Beans should not be planted until the ground is warm and in good physical condition. This will usually be from May 1st to 15th on the coast, May 1st to June 1st in the interior valleys. Seeds planted in a cold, damp soil are apt to rot before they can germinate or if they do start to grow they will produce stunted vines that cannot mature a full crop of beans. Limas should be planted in a warm, moist soil and it may be necessary to take advantage of a few warm days in order to get these conditions.

Planting. The distance between rows and between plants in each row depends upon the variety, the soil, and whether or not irrigation is going to be practiced. For Limas, the distance ranges from thirty to forty inches between

* Wickson, "California Vegetables."

the rows and from eight to twelve inches in the row. The other varieties are planted from twenty-four to thirty inches apart between rows and four to eight inches in the rows. On heavy moist soils and when irrigation is used, the wider distances should be used between rows and hills. Also, those varieties which normally produce large vines should have a wider distance between hills than varieties producing small vines. A seed drill should be used for planting whenever possible as it insures the seed being placed in and covered with moist soil. On small plots where it is necessary to plant by hand, club members should be careful to see that the seeds are surrounded with moist soil. One to two inches is the depth to plant, dry soils requiring the greater depth.

Cultivation. The Lima bean vines should be cultivated three or four times before they begin to run. A cultivator having knife-shaped teeth is the most efficient implement to use as it keeps weeds down and mulches the soil better than the straight-toothed cultivator. Cultivation will have to be continued longer when the bush varieties are grown as the vines will not shade the ground and consequently check evaporation so much as do the running beans.

Irrigation. While it is said that the Lima beans grown along the coast will often "make a crop out of a fog," irrigation will often double the yield both there and in the interior valleys. The easiest way to apply water to beans is to run it in deep furrows between the rows. Usually one irrigation will be enough. In the case of Limas, the water should be applied just before the last cultivation. Irrigation should always be followed by cultivation just as soon as possible so as to check evaporation and leave the surface soil well mulched.

Harvesting. Beans grown on light or unirrigated soils will ripen two or three weeks earlier than on heavier or irrigated land. Usually the Lima crop must be gathered before all the beans have ripened, because of the shelling of the early maturing pods and the danger of rain. The bush varieties ripen more evenly and are earlier in maturing. The vines are usually cut with the special bean harvester, but on small plots may have to be pulled by hand.

Bean Improvement. The selection of the best individual plants in the field is the most practical and satisfactory way of securing a better yielding strain of beans. The first selection should be made at blossoming time, when the most vigorous, early flowering plants will be noted and perhaps marked with a stake. Frequent inspection of the vines should be made until harvest time. Limas especially will be found to differ in rankness and vigor of growth; some are heavily podded while others produce but few pods; many vines will be green and possibly in full blossom while others will have matured their crop and are drying up; some have withstood a bad season or an alkali soil better than the rest and still others differ in the size and color of the seed. All of these differences must be considered by the bean grower because the natural law of heredity will tend to perpetuate these individual differences in the offspring. It may require considerable thinking before club members can decide which plants will be the best to save to furnish seed for next year's planting. One thing that will probably be noticed is that the earliest maturing vines are not apt to be the heaviest yielding ones, as earliness and prolificness seem to be two conflicting characters. Contestants growing Lima beans should look for the heaviest yielding vines and save that one which has produced the greatest number of matured pods.

The seed from the highest-yielding vines should be saved and used to plant a special seed-improvement plot next year. The best vines grown on this plot

and improving the quality by selecting the most prolific vines and saving the seed to plant special bean improvement plats another year. Incidentally, the members of this club will strive to learn all they can regarding the science of soils and plant growth and put this knowledge to practical use growing our beans.

Article III. Membership. Any boy or girl in this school district, not over eighteen or under eight years of age, is eligible for membership in this club. Any adult person, interested in the club and its work, may be elected to honorary membership by a majority vote of those members present at any regular meeting.

Article IV. Officers. The officers of this organization shall consist of a President, Vice-President and Secretary and an Advisory Committee, consisting of the principal or teacher in the school, who shall act as chairman of the committee, the President of the club and one or more adults in the community not connected directly with the school, but who are interested in the club and its work.

Article V. Duties of Members. In addition to the duties prescribed in the rules, each member of the club shall attend all regular meetings and perform such duties as may be assigned to him. Each member obligates himself to read and partake in the discussion of all books, bulletins and articles pertaining to bean growing, considered by the club.

Article VI Duties of Officers. The *President* shall preside at all meetings and perform those duties that usually devolve upon such an officer.

The *Vice-President,* in the absence or disability of the President, shall act as the presiding officer.

The *Secretary* shall keep minutes of all meetings and shall submit a report at the end of the contest to the City or County Superintendent of Schools, describing the club and its work and the results of the contest.

The *Advisory Committee* shall arrange for all public contests and exhibits, the procuring and awarding of prizes and certificates, the sending of letters and circulars of information, advise the club members with regard to their work, assist in arranging the club programmes and meetings, and keep the general public duly informed of the progress of the club's work. The chairman of the Advisory Committee shall have general oversight and direction of the club and shall exercise authority in all cases not otherwise delegated.

Article VII. Regular Meetings. Regular meetings of the club shall be held on the first and third Friday of each month during the school year (or any other time desired). At least one meeting a month should be held during vacation (the time and date to be determined by the Advisory Committee). The purpose of these meetings should be the systematic study of books, bulletins and articles on bean growing and the discussion of those factors in the environment of plants that have direct bearing upon bean culture. It will be possible for the teacher in these meetings to have the members perform simple exercises with seeds, growing plants, and soils, or to demonstrate these before the club, thus vitally connecting the school work with the outdoor and home work.

The First Work. After the constitution has been adopted and the officers elected, the next step will be to determine the nature of the work to be undertaken first. If the club is started in the winter months, a study of some of the books, bulletins and articles on bean growing would be taken up. This should lead to something definite to be done in the spring and summer. After actual work is started, the seasonal sequence of cultural operations will determine to a large extent the nature of the discussion at the regular meetings.